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THE SELECTION OF LAND FOR GENERAL
FARMING IN THE GULF COAST REGION
EAST OF THE MISSISSIPPI RIVER

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THE SELECTION OF LAND FOR GENERAL FARMING IN THE GULF COAST REGION EAST OF THE MISSISSIPPI RIVER.

INTRODUCTION.

The agricultural opportunities in this section of the South are attracting many people from other localities, chiefly from the Northern States. In the last few years there has been marked activity on the part of real-estate and colonization companies, as well as of railways and some industrial organizations, in advertising the resources of this region and particularly in promoting the sale of the cut-over pine lands.

The majority of the immigrants who purchase land for general farming have had little or no experience with such soils as commonly occur in this part of the Gulf Coast country. In too many instances the choice of location is largely determined by considerations other than the character of the soil or its adaptability to the kind of farming to be pursued. While accessibility to markets, the local facilities for transportation, and communication, as well as the general social conditions of a locality should be given due consideration, the soil itself is of first importance in the selection of land for a farm home.

This paper discusses only the general soil characteristics, and but little more than mentions the chief problems in southern agriculture. It gives briefly such information as should be at the command of anyone contemplating the purchase of farm land.

The territory to which reference is made embraces the southern third of Mississippi and the adjoining portion of Louisiana to the south; that part of Alabama below the "Black Belt";¹ the southern counties of Georgia, and the northern ones of Florida. The peninsular portion of the latter State is excluded, since its main physiographic and geologic features differ from those of the region to the north and northwest. A line drawn from Vicksburg, Miss., through Jackson and Meridian, thence a little south of Montgomery, Ala., to Savannah, Ga., roughly marks the northern limits, although no sharp boundaries are intended or even possible to outline.

¹The calcareous soils of south-central Alabama, forming an irregular belt 10 to 25 miles wide across the State just below Montgomery.

The northern part of this region has a general elevation of 400 to 500 feet. While there is a gradual slope toward the south, it does not in all instances extend entirely to sea level. In many places the uplands have an average elevation of 100 feet or more to within a few miles of the coast.

The topography is varied, ranging from very hilly areas to broad, undulating divides which include considerable level land. In general it may be described as hilly to rolling. The larger valleys usually have considerable second bottom or bench land.

A magnificent forest of longleaf pine once covered practically all the hills and well-drained areas in the valleys. Most of the low land along the streams was covered with a mixed growth of deciduous trees, pine, and underbrush, varied by comparatively open canebrakes. The cane has largely disappeared, but much of the low land is still densely forested. The total area of true swamp is generally overestimated. Much of the so-called swamp is overflow land, comparatively dry the greater part of the year.

While the physical factors governing so largely the permanent agricultural value of soils, as herein mentioned, apply to old land as well as new, the intelligent selection of the latter is of the more importance to the average investor, as it is the cut-over lands that are so generally being offered for sale.

In the selection of land for general farming, there are five important factors that should be given careful consideration. They may be summarized as follows: (1) In all sections of this region there are wide local variations in the soils; (2) on account of the amount and distribution of the rainfall effective drainage is highly essential; (3) the cost of clearing cut-over land is frequently underestimated; (4) with few exceptions the soils are deficient in humus; and (5) artificial fertilization is required for most crops.

LOCAL VARIATIONS IN SOIL TYPES

A glance at a detailed soil map of almost any area in the Gulf Coast country will show the diversified character of the land. On the scale of map used—1 inch to the mile—the minor variations can not be represented, although in most of the later surveys from 15 to 30 soil types and phases have been mapped and described. These reports, as a rule, cover but one county.

Notwithstanding the similarity in surface features presented on extensive tracts of arable land, the areas are comparatively limited—usually less than a few hundred acres in an unbroken body—where the soil is sufficiently uniform to be classed as one type. There are generally several classes of soil, sands, sandy loams, and loams occurring in the same locality, or even within the limits of a moderate-sized farm.

After leaving the rich alluvial soils of the Mississippi River bottoms and the loess area of the uplands east of that valley, the traveler in proceeding eastward finds the prevailing soils to be grayish sands or sandy loams. Clay loams are of rather limited extent except in certain localities. He may also observe that the subsoils of upland types, as exposed in road cuts and ditches, range in color from yellow through various shades of brown to bright red. The coloration is often remarkable in the sharp contrasts presented within short distances.

An inspection of the uplands in almost any locality, or of the higher bench lands on the larger streams, will show great variations in the depth of the soil—or surface layer to that depth at which there is noticeable change in color or composition when compared with the subsoil—and in the physical characteristics of the subsoil itself. In a part of a field the soil may consist largely of sand, graduating at a depth of a few inches to clayey material, while near by the sand may be 2 or 3 feet deep. Besides this difference in depth to the “clay foundation,” as southern farmers call the substratum, the sand itself may vary greatly in texture, at one point being so fine that it packs easily and has the physical properties of a loam, to a sand so coarse as to be “leachy.”

The variation in the depth, texture, and structure of the subsoils is quite as frequent as the diversification in color to which reference has been made. The extreme range is from a heavy clay, so dense as to be nearly impervious, to a loose quartz sand of little agricultural value. Such conditions are the exception, and not the rule, and the occurrence of substrata having undesirable properties is usually indicated by the topography, character of the vegetation, or other surface appearances. There are, however, frequent developments of soil types where, without marked surface indications, the subsoil so closely approaches these extremes as to impair the value of the land agriculturally or to render its successful management more or less difficult.

A clayey subsoil with enough sand to give it a somewhat coarse, gritty feel and a “grainy” appearance in a hand sample is preferable to a clay with but little sand or silt. Such material is crumbly rather than plastic, and will absorb moisture rapidly compared with a material composed largely of clay. The latter is less desirable here either as a soil or subsoil than in a region where the rainfall is not so heavy.

DRAINAGE.

Since the annual precipitation is about 60 inches, the necessity for good surface drainage is quite obvious. It is equally as important that the underdrainage, or, more correctly stated, the internal drainage, of the soil and subsoil should be so effective that a saturated

condition of either can not long prevail in normal seasons. The soil, on the other hand, should be sufficiently retentive of moisture to carry a crop safely through a dry period should one occur. The ideal soil in this respect is a loam or sandy loam, not less than 5 or 6 inches nor more than 15 or 20 inches deep, overlying a moderately compact sandy clay subsoil. The greater depth to which the latter extends without essential change in character the better.

In a type of this kind a heavy rainfall is largely absorbed by the soil and held, as it were, until much of it is diffused through the subsoil. The excess water—gravitational water—in the soil sinks downward with comparative rapidity, so that the saturated condition of the soil is of short duration, although a sufficient amount of moisture—capillary water—is retained in the subsoil and underlying stratum to supply the soil with moisture as the latter is taken up by the growing plants or lost at the surface by evaporation.

In short, the soil and subsoil should have the power of maintaining a reasonably uniform moisture content throughout considerable extremes in precipitation. This is a principle in soil physics of universal application, but particularly important in a region where hard rains followed by comparatively high rates of evaporation are the normal, rather than abnormal, weather conditions.

Such desirable qualities are possessed in high degree by all the heavier types of the Orangeburg and Greenville soils.¹ Some of the Ruston and upland Norfolk soils are also very satisfactory in this respect.

The yellow or brownish-yellow subsoils of the heavier Norfolk types have not, as a rule, such perfect underdrainage as the red or reddish-brown material underlying the above-mentioned soils. Some of the Norfolk and associated types are inclined to be too retentive of moisture. In places this is due to the lack of surface drainage, but more frequently there is a closeness of structure that admits of only a rather slow reduction in any excess of soil water.²

In general all the gray sandy soils with yellowish clay subsoils are safest as the coloration of the latter approaches reddish-yellow or brown tints. Land having a pale yellow subsoil with tendency to grayish mottling usually requires drainage. Very light gray, or "putty colored," material almost invariably indicates badly water-logged conditions during a part of each year.³ The occurrence of

¹ See descriptions of the Orangeburg and Greenville types in soil survey reports of Butler, Henry, Coffee, Pike, and Baldwin Counties, Ala.; also reports on Gadsden, Escambia, and Jefferson Counties, Fla.

² See descriptions of Norfolk types in various soil survey reports of areas in the Southern States. In the late surveys the types having light-red or reddish-brown subsoils are assigned to the Ruston series.

³ See descriptions of the Myatt soils of northern Florida and southern Alabama, also of the Kalmia, Waverly, and Ocklocknee series.

small red or dark-brown iron concretions in upland types usually suggests a heavy but well-drained subsoil.

Heavy clayey soils are more difficult to keep in good tilth than the corresponding types in regions of less rainfall. Where the surface is hilly terracing is necessary.

While deep sands are open to objection, except for special crops, some of the gray upland sands having a sandy clay substratum at less than 4 feet are very productive under careful management. The cost of maintaining fertility is greater than on the sandy loams and the liability of injury to crops in very wet or exceptionally dry seasons is greater than on the heavier types.

Red sands¹ are more desirable, other conditions being equal, than gray sands. Black sand, if the color is due to the large admixture of muck, will assume a light grayish tint after a few years of cultivation.²

Calcareous soils are limited to a comparatively few localities. Some of them are very productive, but rather difficult to handle.³

As one becomes acquainted with the natural features of a locality many variations in the character of the native vegetation may be seen to be due to soil differences. Specific rules in this report can not be given wide application, for there are too many factors besides soil conditions affecting the distribution of the native plants. The most important single element, from the standpoint of soils, is that of drainage. The surface conditions are usually apparent at a glance, but the average moisture content of the reasonably well drained lands and their general agricultural value may be judged by the natural vegetation.

On the sandy and fine sandy loams of the uplands the longleaf pines are generally larger and uniformly of better quality than on either deep sands or shallow soils underlain by heavy clay. While fine specimens of these trees may be seen on the latter soils, the forest is scattering and irregular with respect to the size of the pine and the character of the secondary growth. On the Susquehanna soils the longleaf pine is generally smaller than on the Norfolk and Orangeburg types or well-drained valley lands. A mixed growth of good pine and large well-developed oak indicates a soil of high agricultural value.

Where the soil to a depth of several feet is chiefly sand, scrubby oaks are generally numerous. Such light soils are also favorite loca-

¹ In the classification adopted by the Bureau of Soils material consisting of 80 per cent or more of sand to a depth of 3 feet is classed as sand; if from 20 to 50 per cent is silt and clay, as sandy loam; silt and clay loams consist of 50 per cent or more of the latter, or finest, soil particles.

² See descriptions of Portsmouth soils of Georgia and Florida.

³ See descriptions of the Houston soils in soil survey reports of Montgomery County, Ala., and Jasper County, Miss. Some phases of the Susquehanna soils of Pike and Coffee Counties in Alabama are derived from limestone.

tions for the dogwood, although this tree is often seen on the best land. The extensive occurrence of small blackjack oak is indicative of some extreme textural conditions—usually a dense clay, but not infrequently a deep, loose sand.

On the second bottoms, where the soils are well adapted to general farming, there is a mixed growth of longleaf and shortleaf pine, with more or less hardwood. On the poorly drained portions of the bench lands the shortleaf pine is generally the dominant timber tree. Gallberry bushes are an indication of acid soil.

CLEARING NEW LAND.

On most of the cut-over pine lands some of the original forest remains, consisting of saplings and more or less large timber of inferior quality, much of the latter being dead. There is usually a good deal of fallen material, wind-blown trunks, rejected logs, and the heavier parts of the tops, or "slash," that remain unburned by the annual fires which consume the light trash and grassy undergrowth.

The remaining pine makes excellent fuel, fencing material, and rough lumber for building. On some land there may not be much more of it than will be required for such purposes. In many places, however, the ground is heavily encumbered with fallen logs, as in old turpentine orchards, and wherever storms have blown down hundreds of the tall pines.

Near the towns cordwood, both green pine and "light wood knots," as the resinous heart wood of limbs and old logs is called, may be marketed at fairly remunerative prices.

There is also a limited demand for this fuel by railways and steamboats. In some localities the distillation of turpentine from pine wood is a commercial success, the tops and stumps being used. The utilization of all material left by the sawmills is increasing very rapidly, but in sections remote from the railways it has no present value.

The pine stumps are the chief obstacle in the cultivation of the cut-over lands. They vary in number from a very few to upward of 50 or 75 to the acre, generally less than the latter estimates. The diameter at a foot or so above the ground ranges from 6 or 8 inches to 2 feet. The average may be placed at about 20 inches, increasing on good land.

Since they are highly resinous the stumps burn readily, and this is one of the most practical means of getting rid of them. It is necessary to dig a hole at one side to a depth of a foot or so and put some dry wood against the taproot, otherwise the fire will go out after the surface of the stump becomes charred. A hole bored obliquely through the main root just below the ground facilitates the burning. The large lateral roots require grubbing.

Dynamite has been used to a limited extent, the most satisfactory results being attained on land having a heavy clayey subsoil. A large stump puller will handle any of the pine stumps, but the cost of the machines, and also the difficulty of disposing of the stumps after they are out of the ground, deter many of the smaller land-owners from employing this method.

Roughly estimated, the cost of clearing cut-over pine land may be placed at about \$20 an acre. In one county where many northern people have recently settled, the cost is said to range from \$10 to \$20, the latter figure in some instances including fencing. Land may be quite satisfactorily tilled, however, where only the fallen wood, small stumps, and the laterals of the larger ones have been removed.

In most of the well-settled counties stock is not permitted to run at large. Where large tracts of open land remain there is generally no stock law, so all fields must be fenced before a crop can be safely planted.

DEFICIENCY OF ORGANIC MATTER.

Practically all the well-drained soils are deficient in organic matter. This is true not only of the ground that has been in cultivation many years but of virgin land as well. In the latter there is a small store of decaying vegetable matter, but it is very meager compared with that in the northern prairie soils. This is due chiefly to the climatic conditions, and also in some measure to the character of the native vegetation.

On account of the high average temperature, the humidity, and the absence of a winter season, the decay of organic debris is comparatively rapid. The process takes place faster in light-colored soils of open structure than in heavy, dark-colored types. Or, more correctly stated, perhaps, the products of decomposition are lost in the former a little faster than in the latter.

This lack of organic components should not be considered a serious or permanent defect in any type. There is such a great variety of minor crops, as cowpeas, soy beans, velvet beans, vetches, and grasses, besides fall-sown grains, that can be easily and profitably grown that at no season of the year is it necessary for land to be without vegetation of some kind upon it. There is ample opportunity for pasturing off or plowing under a heavy covering of this kind without interfering in the least with the production of a staple crop on the same land.

By this means the fertility of any type having desirable physical properties may be economically increased and the necessity for commercial fertilizers correspondingly reduced.¹

¹ The results of crop rotations and the beneficial effects of green manuring are discussed in many of the publications of the U. S. Department of Agriculture and the State experiment stations.

THE USE OF FERTILIZERS.

Commercial fertilizers are in universal use throughout this section. Recently cleared land, some of the valley soils, and a few upland types of exceptional fertility require no artificial enrichment, but on most types an application of some kind of fertilizer is considered necessary. Nitrogen, phosphorus, and potash are the substances to be supplied. To these lime may be added, but it is not generally used. A complete fertilizer is one containing at least some quantity of each of the first three elements.

Nitrogen is the most expensive. In the manufactured goods commonly sold the guaranteed percentage of nitrates is secured by the use of cottonseed meal, nitrate of soda, or some kind of slaughterhouse refuse. While enormous quantities of nitrogenous substances are annually purchased by farmers, the requirements of all the staple crops could be largely met by the methods of soil management suggested in the discussion of the organic soil components. The increasing demand for nitrogenous fertilizers is due in a large measure to the prevailing system of farming.

Phosphorus, or phosphoric acid, the latter the form in which this element is obtained, is finely ground rock phosphate treated with sulphuric acid to render the phosphorus more soluble. It is practically indispensable in southern agriculture, and most of the brands of fertilizer used on corn and cotton land contain relatively high percentages of this element.

Nearly all the potash used in the manufactured fertilizers comes from Germany. Muriate of potash, potassium chloride, potassium sulphate, and kainit are forms of this material. It is omitted from many grades of commercial fertilizers. Potash is considered more necessary on light, sandy soils than on heavy ones.

As a very rough approximation of the outlay per acre each year for ordinary crops, it may be stated that from 200 to 400 pounds of commercial fertilizer, costing from \$20 to \$25 a ton, is used. Of course, many farmers apply much greater quantities and others less. Land devoted to grass and forage crops is not generally fertilized. Light sandy soils usually require higher fertilization than the heavier types. When fertilizer is used more durable results are noted on the latter. On poorly drained or indifferently tilled soils fertilizers are of little benefit.¹

With few exceptions the maintenance of fertility is a fixed charge that must be met as long as the land is cultivated. With the increas-

¹ The literature relating to commercial fertilizers is voluminous. The results of many experiments on different soils and with various crops are given in the publications of the State experiment stations. A summary of much of this information on cotton, corn, potatoes, and some miscellaneous crops may be found in Bulletins 62, 64, 65, and 67, respectively, of the Bureau of Soils.

ing cost of producing all the staple crops it is of the highest importance that the purchaser of land for general farming should select those soils on which fertilizers may be used with the greatest degree of economy and efficiency, conditions determined chiefly by the physical properties of the type.

Approved.

JAMES WILSON,

Secretary of Agriculture.

WASHINGTON, D. C., *July 3, 1911.*



